

REMARKS

Preliminary Matters

Claims 27 and 30-55 are pending in the application. Claims 34-52 are withdrawn from consideration and claims 27, 30-33 and 53-55 are rejected.

Applicants thank the Examiner for withdrawing the rejection of claims 27-32 under 35 U.S.C. § 102(b) as allegedly being anticipated by Nobuaki (JP 2002-056863 A), and the rejection of claim 33 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Nobuaki and Vaidyanathan (U.S. Patent No. 4,585,711), based on the Amendment filed March 6, 2009.

Claim 30 is amended to correct dependency from claim 27.

No new matter is added, and therefore, Applicants respectfully request entry of the present Amendment.

Response to Claim Rejections Under 35 U.S.C. § 103(a)

Claims 27-32 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Nobuaki in view of Williams et al. (U.S. Patent No. 4,835,071).

Claim 33 is rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Nobuaki and Williams as applied to claims 27, 39-32 and 53-54, and further in view of Vaidyanathan.

Claim 55 is rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Nobuaki and Williams as applied to claims 27 30-32 and 53-54, and further in view of Hampden-Smith et al. (U.S. Patent Application Publication No. 2002/0107140 A1).

Applicants traverse each of the above § 103 rejections, at least for the following reasons.

Initially, Applicants respectfully submit that claims 28 and 29 were canceled without prejudice or disclaimer in the Amendment filed March 6, 2009, and the subject matter of claims 28 and 29 were incorporated into claim 27.

Present claim 27 recites an electrode used for a fuel cell. The electrode of claim 27 comprises a substrate, a current-collector arranged on one of the surfaces of the substrate, and a catalyst layer arranged on the other surface of the substrate. Claim 27 further recites that the substrate contains carbon as a principal component, the current-collector contains an element which will make carbide, the current-collector and the substrate are bonded to each other, and a carbide layer is formed at an interface between said substrate and said current-collector.

At page 3 of the Office Action, the Examiner admits that Nobuaki does not specifically disclose that a carbide layer is formed at an interface between the electrode substrate and the current collector. The Examiner relies on Williams to teach an electrode having a nickel current collector bonded to an electrode. Although the Examiner admits that Williams does not specifically disclose a carbide layer formed at an interface of the electrode and current collector, the Examiner's position is that such a carbide layer is inherently formed, given that Nobuaki, Williams and the present application all utilize the same materials and structure for an electrode and a similar method for applying the current collector to the electrode.

Applicants respectfully disagree with the Examiner's characterization of Williams with respect to the presently claimed invention.

The Experimental section of Williams discloses that very thin W or Mo porous metallic electrodes were sputtered onto a rotating masked BASE (β -alumina solid electrolyte) tube. See columns 6, lines 28-32. At column 4, lines 63-64 of Williams, it is disclosed that BASE has a nominal composition of $\text{Na}_{5/3}\text{Li}_{1/3}\text{Al}_{32/3}\text{O}_{17}$. At column 6, lines 56-58 of Williams it is disclosed

that current collector grids for the W electrode, were constructed of a single cylindrical wrapping of expanded Ni mesh. Furthermore, it is disclosed that the current electrode is tied in place using loops of Mo wire. Still further, it is disclosed that the linear coefficient of expansion of Ni is substantially greater than those of BASE, Mo and W, and therefore, the Ni grid bonds strongly and permanently to the electrode and the tie-wires. See column 6, lines 61-66 of Williams.

In view of the above, the BASE cylinder used as a substrate in Williams does not contain carbon as a principal element. Therefore, although Williams discloses the use of a Ni current collector, in the absence of carbon in the BASE cylinder, there is no carbide layer formed between the substrate and the current collector. Accordingly, Williams does not make up for the deficiency in Nobuaki with respect to the absence of a teaching that a carbide layer is formed at an interface between the electrode substrate and the current collector. Moreover, there is no motivation to combine Williams with Nobuaki because the current collector of Williams is tied to the electrode using Mo wires.

Thus, claim 27 is patentable over Nobuaki, individually, or in any reasonable combination with Williams. Claims 30-33 are also patentable, at least by virtue of their dependence from claim 27. Claims 33 and 55 are also patentable by virtue of their dependence from claim 27, and because neither Vaidyanathan nor Hampden-Smith make up for the above deficiencies in the combination of Nobuaki and Williams.

Accordingly, Applicants respectfully request reconsideration and withdrawal of the § 103 rejections of claims 27, 30-33 and 55 based on Nobuaki, individually, and in any reasonable combination with Williams, Vaidyanathan and Hampden-Smith.

Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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